

Development and Testing of the Original ERS Behavior Checklist: An Historical Perspective

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Objectives: Phase 1

To develop the EFNEP Evaluation and Reporting System (ERS) behavior checklist, to meet the following criteria:

- To assess behaviors that could not be evaluated using the 24-hour recall
- To be simple and brief for low-income families
- To include feedback from states, feedback from participants, and show sensitivity to change

Objectives: Phase 2

To investigate indicators of reliability and validity for Behavior Checklist questions in the EFNEP Evaluation and Reporting System (ERS)

Validity

- **Face validity** is a measure of how representative a research project is 'at face value,' and whether it appears to be a good project.
- **Content validity** is the estimate of how much a measure represents every single element of a construct.

Source: Experiment-Resources.com (2009).

Subjects

- USDA recommended 14 States as possible data sources.
 - Data from four were included in these analyses: CO, OK, SD, and VA.
 - Non-pregnant, non-lactating EFNEP participants
- Numbers:
- 5270 at exit (checklist only)
 - 2440 at exit (all data including 24-hour recall)

Sources of Data

- Demographic data (income, etc.)
- 24-hour recalls
- Behavior checklist

ERS Behavior Checklist Q. How often do you...
1. Plan meals ahead
2. Compare prices before buying food
3. Run out of food before the end of the month
4. Shop with a grocery list
5. Let foods sit out for more than 2 hours
6. Thaw frozen foods at room temperature
7. Think about healthy food choices
8. Prepare foods without adding salt
9. Use "Nutrition Facts" on the food label to make food choices
10. Children eat within 2 hours of waking up

* p=0.01; *** p=0.0001

EFNEP Data: Partial Healthy Eating Index

Component (each scored 0-10 in proportion to adequacy)	Healthy Eating Index (HEI, version 1)	Partial Healthy Eating Index (PHEI)
Grains (6-servings)	X	X
Vegetables (3-5 servings)	X	X
Fruits (2-4 servings)	X	X
Milk (2-3 servings)	X	X
Meat (2-3 servings)	X	X
Total fat (30% or less energy)	X	X
Saturated fat (10% or less energy)	X	
Cholesterol (300 mg or less)	X	
Sodium (2400 mg or less)	X	
Variety (16 different foods in 3 days)	X	

Reliability

- A **reliable** question is "one that consistently conveys the same meaning to all people in the populations being surveyed." (Berdie et al.)

Alpha coefficients for all 10 questions in the behavior checklist were:

.71 (raw)

.72 (standardized)

Construct Validity

- Construct validity** defines how well a test or experiment measures up to its claims. A test designed to measure depression must only measure that particular construct, not closely related ideals such as anxiety or stress.
 - Convergent validity** tests that constructs that are expected to be related **are**, in fact, related.
 - Discriminant validity** tests that constructs that should have no relationship **do not**, in fact, have any relationship. (also referred to as divergent validity)

Source: Experiment-Resources.com (2009).

Criterion Validity

- Criterion Validity** assesses whether a test reflects a certain set of abilities.
 - Concurrent validity** measures the test against a benchmark test, and high correlation indicates that the test has strong criterion validity.
 - Predictive validity** is a measure of how well a test predicts abilities. It involves testing a group of subjects for a certain construct, and then comparing them with results obtained at some point **in the future.**

Source: Experiment-Resources.com (2009).

Questions for Exploring Criterion Validity

- Do people who report higher scores on the diet quality and food resource management indicators of the checklist also have higher diet quality, as measured by the PHEI (from the 24-hour recall)?



Indicators of Diet Quality and Food Resource Management

- Planning meals ahead
- Comparing prices before buying food
- Shopping with a grocery list
- Thinking about healthy food choices
- Preparing foods without adding salt
- Using "Nutrition Facts" on the food label to make food choices, and
- Children eating within 2 hours of waking up.

Checklist Questions and PHEI

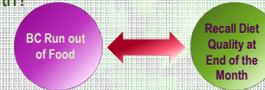
Baseline: Significant relationships to 6 of the 7 DQ and FRM questions:

- Plan meals ahead [p<.0001]
- Shop with a grocery list [p<.0001]
- Think about healthy food choices [p<.0001]
- Prepare foods without adding salt [p<.01]
- Use "Nutrition Facts" on food labels [p<.01]
- Children eat within 2 hours of waking up [p<.0001]

No significance to comparing prices, food safety or food security

Questions for Exploring Criterion Validity

2. Do people who say they run out of food before the end of the month have a poorer diet *if their food recalls are taken during the last week of the month* compared to people who give recalls during the first three weeks of the month?



Running out of Food and Diet Quality

Results:

People who said they ran out of food before the end of the month had significantly poorer dietary intakes (PHEI) **only** when week of the month when data were collected was entered into the model.

(Baseline data [p=.01]; at exit adding week of the month increased significance [p=.0001]).

Questions for Exploring Criterion Validity

4. Are people with lower incomes more likely to run out of food before the end of the month?



Running out of Food and Poverty Level

Results:

- People who said they more often ran out of foods before the end of the month had significantly lower incomes.
- People who compared prices before buying foods also had lower incomes.
- No other diet quality or FRM variables were associated with poverty level.

(Both baseline and exit data).

Questions for Exploring Criterion Validity

5. Do people who more often read "Nutrition Facts" on food labels consume foods lower in fat?



Reading Nutrition Facts and Grams of Fat Consumed

Results:

People who said they more often read "Nutrition Facts" on food labels consumed significantly fewer grams of fat in their diets.

(Both baseline and exit data).

Questions for Exploring Criterion Validity

- Do related questions on the Behavior checklist cluster together, such as those indicating diet quality or food safety?

Factor Analysis: Principal Components

ERS Behavior Checklist Q	Factor 1	Factor 2	Factor 3
1. Plan meals ahead	.63	-.30	-.28
2. Compare prices before buying food	.62	-.22	.01
3. Run out of food before the end of the month*	.34	.43	-.14
4. Shop with a grocery list	.63	-.24	-.08
5. Let foods sit out for more than 2 hours *	.42	.69	.02
6. Thaw frozen foods at room temperature *	.53	.55	-.23
7. Think about healthy food choices	.67	-.17	-.10
8. Prepare foods without adding salt	.41	-.07	.64
9. Use "Nutrition Facts" on the food label to make food choices	.68	-.17	-.20
10. Children eat within 2 hours of waking up	.44	.02	.60

* = Reverse Coded

Inter-Item Relationships

Strongest inter-relationships were found for the following clusters:

- ☆ Diet Quality/Food Resource Management
 - plan meals ahead
 - compare prices before buying food
 - shop with a grocery list
 - think about healthy food choices
 - use "Nutrition Facts on the food label"

Inter-Item Relationships

Results (contin.):

- ☆ Food Safety
 - let foods sit out for more than two hours
 - thaw frozen foods at room temperature
- ☆ Food Security
 - run out of food before the end of the month
- ☆ Other
 - prepare foods without adding salt
 - children eat within 2 hours of waking up

Conclusions

- The 10-item checklist shows adequate reliability scores.
- The ERS Checklist items behave consistently with other indicators for:
 - Diet quality, as measured using the PHEI and checklist questions to assess DQ and FRM.
 - Running out of food and poorer diets at the end of the month.
 - Running out of food and lower incomes.
 - Reading "Nutrition Facts" and eating less fat.
 - Internal inter-item relationships related to content.

Summary Table: Development and Testing of the ERS Behavior Checklist¹

Construct	Task	Dates
National input	<ul style="list-style-type: none"> ▪ National EFNEP Reporting System Committee (ERSC) identified the need for a behavior checklist; a subcommittee was formed. 	Dec., 1990
Construct validity (1)	<ul style="list-style-type: none"> ▪ A questionnaire sent to all state coordinators to assess what they felt were needed indicators for a national reporting system. ▪ Existing instruments were solicited and reviewed by the Checklist subcommittee, together with other national tools such as the NFCS Diet and Health Knowledge Survey. ▪ Four domains were identified based on objectives of the curriculum. ▪ The Subcommittee prepared the first draft, which was revised by ERSC. 	Jan.-Feb., 1991
National input	<ul style="list-style-type: none"> ▪ First checklist sent to EFNEP Coordinators in all states; 50 EFNEP Coordinators and others submitted extensive comments. 	May-June 1991
	<ul style="list-style-type: none"> ▪ Subcommittee prepared a summary of feedback, revised the draft instrument, and submitted these to the ERSC and members of USDA for review and comment. 	Dec., 1991
Construct validity (2)	<ul style="list-style-type: none"> ▪ An expert panel convened to review and respond to the draft checklist and a summary of the feedback from all states. 	Feb.-Mar. 1992
	<ul style="list-style-type: none"> ▪ Subcommittee revised the checklist in response to Expert Panel recommendations (which included suggestions regarding both the questions themselves and the response categories). Additional questions were drafted and/or selected from national standardized instruments, to identify the best indicators for the domains through focus groups and pilot testing. 	May-June 1992
Face validity	<ul style="list-style-type: none"> ▪ Prospective focus group leaders were provided with training materials and protocols. Focus groups were conducted in 5 states selected to represent a diversity of EFNEP clientele. Procedures were similar to those of cognitive testing; purpose was to ensure that terms and questions were clearly and accurately understood. 	Sept.-Oct., 1992
	<ul style="list-style-type: none"> ▪ Focus group results were summarized and the checklist revised. ▪ Procedures for conducting the pilot test were developed, which involved a pre-post, treatment/control group design. 7 states participated. The draft instrument included about 25 items so that the weakest questions could be eliminated. 	Jan.-Feb. 1993
Reliability Sensitivity Difficulty	<ul style="list-style-type: none"> ▪ Pilot test results were analyzed by Michael Lambur and Ruby Cox. Analyses included internal reliability, sensitivity and difficulty, pre-post means and cross-tabs, and final reading level. Final revisions were made and the instrument was reduced to the strongest 15 questions. 	Mar.-June, 1993
	<ul style="list-style-type: none"> ▪ A new committee was established to revise the ERS checklist ▪ A revised 10-item checklist, with an additional optional bank of questions, was released in ERS Version 3.3. 	1994 - 1997
Reliability Validity	<ul style="list-style-type: none"> ▪ The current core 10 behavior checklist items were further tested for internal indicators of validity and reliability, with excellent results. 	2000

¹ Details of these procedures and lists of contributing participants are given in the two Acknowledgments sections at the beginning of the EFNEP Evaluation/Reporting System Users Guide.